

# Adversity Quotient and Metacognition as Related to Mathematics Performance

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**Abstract:** This descriptive ascertained the relationship of adversity quotient and metacognition to mathematics performance students. There were three hundred (300) respondents who were randomly selected from two high schools. Data gathering instruments used were adversity quotient and metacognitive awareness questionnaires. There was a significant strong significant relationship between adversity quotient and mathematics performance. Also, a strong positive correlation was recorded between metacognition and mathematics performance. Thus, the higher students' adversity quotient and metacognition are associated with higher mathematics performance.

**Keywords:** adversity quotient, metacognition, mathematics performance, correlation.

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## Introduction

For the students to become competent and gain a rich foundation in mathematics they need to be equipped with high mathematical achievement, adversity quotient, and metacognition. A solid mathematical foundation is especially important because it allows youngsters to better acquire new and advanced mathematical knowledge, which leads to successful participation in higher mathematics and increasingly knowledge-based society. For children, mastering mathematics will be essential in many facets of their lives (Karaali, 2013). Metacognition is defined as "thinking about thinking" and was established as a concept by John Flavell, who is widely regarded as the field's founding scholar. Metacognition is the ability to regulate one's thought processes by employing various tactics such as organizing, monitoring, and adjusting. It is the ability to reflect on the tasks or processes done, as well as to select and employ the right methods required in intercultural relations (Van de Kamp, Admiraal, van Drie, & Rijlaarsdam, 2016).

Stoltz (1997) defines the adversity quotient as the ability to overcome life's difficulties, whether academic, career, or personal-social in nature. It is about how someone reacts to life, especially the difficult parts. It is a barometer or measure of how one responds to and deals with everything, from minor inconveniences to major obstacles that life might throw at you. The more resilient a person is, the more effectively and constructively he responds to life's challenges, and the more fulfilling his life becomes. The rule of thumb is that the higher the AQ, the more successfully someone will respond to hardship, and the less life's events will diminish his energy, performance, health, and attitude. The lower the AQ, the more difficult it is for him to sustain the enthusiasm, optimism, and tenacity needed to maximize his gifts and his life. Mathematics accomplishment, adversity quotient, and metacognition are critical components in creating a strong foundation in mathematics, especially when combined with the greatest and most effective teaching resources for presenting the courses.

Nowadays, students find mathematics boring and hard to understand. That is why the results are decreasing the level of students' understanding of solving and computing mathematics most especially in fundamental operations which serves as the foundation in higher mathematics. With

this, a teacher will be able to know how students respond to adversaries in life and how their thinking that may affect their performance not only in mathematics but as well in real-life situations. Thus, this study explores the relationship of adversity quotient and metacognition to students' mathematics performance,

## Methodology

A correlational research design was used in this study. Three hundred (300) Grade 7 students were the respondents of the study. They were selected using stratified random sampling from the island and mainland mother schools.

This study used two types of instruments to gather the data needed. One of the instruments was the adversity quotient profile which was adopted from Stoltz (1997). It was a self-rating questionnaire that measures the individual's adversity level in responding to different adverse situations. The other one was the metacognitive awareness inventory which was adopted from Jaleel (2016). It measured the ability of the students to use their thinking skills. Mathematics performance was measured by their grades in mathematics subjects.

Before the data gathering, a letter of permission was sent to the principal and advisers of the two secondary schools. After the permission was granted, the researcher sought the assistance of the concerned teachers to get the data needed such as the number of students per school and the grades of students in mathematics. During the administration of the questionnaires, the researcher introduced himself and oriented the respondents about the purpose of the study, the content of the questionnaires, and how they would answer. The researchers read the instruction aloud and explained it in the local language.

## Results and Discussions

### *Relationship of adversity quotient and metacognition to mathematics performance*

The relationship between adversity quotient and metacognition to mathematics performance was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a strong, positive correlation between the adversity quotient and mathematics performance,  $r = .770$ ,  $p = .000$ . The result indicates that the higher the students' adversity quotient, the higher their performance in mathematics. This result is consistent with Suryadi and Santoso (2013) there is a significant effect of adversity quotient on students' achievement in mathematics. Adversity quotient was considered to be predictive of performance outcomes in mathematics. Hastuti, Sari, and Riyadi (2017) indicated that students with a high adversity quotient were able to handle mathematical learning in a variety of resources and learning approaches. Furthermore, the adversity quotient of teachers shows a favorable association with students' academic achievement (Mwivanda & Uon, 2018).

Results also showed that there was a strong positive correlation between metacognition and mathematics performance of students,  $r = .8112$ ,  $p = .000$ . Students with high metacognition were associated with high mathematics performance. Other studies support this claim showing a significant positive relationship between students' academic performance and metacognition (Zulkiply, 2009; Narang & Sayni, 2013). In addition, metacognition predicts academic performance (Ohtani & Hisasaka, 2018; Alci & Yüksel; 2015).

## Conclusions

A significant relationship was noted between the students' adversity quotient to mathematics performance. When a student's adversity quotient increases, is related to higher mathematics performance. Adversity Quotient is the ability to endure in the face of adversity and to battle to overcome adversity. Students must be able to fight their way out of the difficulties they face. Students must have a high AQ to learn mathematics well because students perceive mathematics to be a challenging topic. A learner with strong success motivation will have the fighting skill and the ability to survive in the face of adversity.

There is also a positive significant relationship existed between students' metacognition and mathematics performance. Metacognition supports successful learning. Metacognition is higher-order thinking that requires active control of the cognitive processes involved in learning. Metacognitive activities include planning how to approach a specific learning task, checking comprehension, and evaluating progress toward task completion. Metacognition is vital for kids to develop because it is essential for successful learning. Previous research on metacognition and academic performance has revealed that metacognition is critical for successful learning. The findings of these studies highlight the significance of metacognition in performance. Students that have strong metacognitive skills, manage, monitor, and assess their performance, and have faith in their capacity to succeed, are the most successful. This suggests that these two variables are strongly associated, implying that the rise in metacognition offers support to the teaching of metacognitive procedures, which improves student performance.

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